Rare disease

How a bowel tumour led to meningitis

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This report summarises a case history in which a 75-year-old man was admitted with bacterial meningitis caused by *Streptococcus bovis*. A subsequent abdominal investigation in the light of the known association between invasive *S bovis* infection and colonic cancer confirmed the suspicion of a cancer located to the rectum. The patient died from *Clostridium difficile* enterocolitis with sepsis and multi-organ failure. This is a highly relevant and interesting case presentation, which besides providing a learning point that patients with *S bovis* infection should undergo investigation for abdominal cancer, describes a 'best practice' pattern in which clinicians followed up on a known association between a rare clinical presentation and underlying disease.

BACKGROUND

Acute confusion in the older people is common and is often attributed to urinary or chest infections even in the absence of good evidence. It is important to consider other sources of infection such as meningitis/encephalitis and perform a thorough clinical examination.

Had it not been for the positive blood cultures, we would not have thought to look for the colonic neoplasm. This case also highlights the importance of keeping in mind key associations – as in this instance, between *Streptococcus bovis* and bowel cancer.

CASE PRESENTATION

A 75-year-old male presented to the emergency department with an 8-h history of drowsiness and fever of 38.4°C. He had reportedly been suffering from a 'flu like illness' over the previous 7 days which included symptoms of myalgia, headache, lethargy and nausea. He also had central abdominal discomfort.

His medical history was noted to include atrial fibrillation, a previous cerebrovascular accident, pneumonia, three myocardial infarctions, a biventricular pacemaker and hypothyroidism.

His medications included spironolactone, lisinopril, nicorandil, levothyroxine and warfarin.

The patient lived with his wife at home and had been fully independent with an exercise tolerance of 200 metres. He had a 60 pack year smoking history and consumed on average 10 units of alcohol every week.

On examination, the patient was febrile, restless, confused and felt peripherally cool with a prolonged capillary refill time of 4 s. His Glasgow Coma Score (GCS) was noted to be 13/15 (E3 M6 V4). He had a pulse of 100 and blood pressure of 130/70. It was also noted that he was tachypnoeic at a rate of 22 and maintained oxygen saturations of 97% on 5l O₂ via a Hudson facemask. Neurological examination revealed photophobia and small pupils with remarkable nuchal rigidity.

INVESTIGATIONS

White blood cell (WBC) count was $11.8 \times 10^9/l$ with a relative neutrophilia ($9.5 \times 10^9/l$). Anaemia of Hb 10.4 g/dl. Raised inflammatory markers with C reactive protein of 57 mg/l.

Arterial blood gas measurement showed normal pH (7.36) with slightly raised CO₂ (6.25 kPa) with elevated bicarbonate of 28 mmol/l.

A CT brain was ordered in view of his reduced GCS – this showed no abnormalities.

A lumbar puncture was then performed which produced cloudy, purulent cerebrospinal fluid (CSF) with a protein content of 7.34 g/l, WBC of 830 μ l (neutrophils of 70%) and glucose of 2.4 mmol/l (serum 6.2 mmol/l).

DIFFERENTIAL DIAGNOSIS

Acute bacterial meningitis.

TREATMENT

The patient was started on intravenous antibiotics as per local Trust guidelines (2 g ceftriaxone 12 hourly plus benzylpenicillin).

OUTCOME AND FOLLOW-UP

The patient was stabilised on the acute medical ward with antibiotics, steroid and fluid support. He improved clinically over a 4-day period. Blood cultures from admission grew *S bovis*. He underwent an echocardiogram (both transthoracic and transoesophageal) to look for evidence of endocarditis and these revealed no vegetation. In view of the known association with bowel cancer, a flexible sigmoidoscopy was performed and led to the discovery of an ulcerating lesion in the rectum confirmed histologically to be a moderately differentiated adenocarcinoma. On follow-up questioning, he had noticed a change in his bowel movements in the 6 months prior to admission with liquid stool and occasional passage of blood but had not sought medical attention.

A surgical review was sought and staging CT arranged which showed no features of metastatic spread. The patient was scheduled for an anterior resection of the rectum and sigmoid colon. Unfortunately 9 days after admission he developed severe diarrhoea and deteriorated with a recurrence of sepsis that rapidly led to multiple organ dysfunction (respiratory failure, acute renal failure, refractory hypotension and metabolic acidosis). He was transferred to the intensive care unit for ventilation, circulatory support and haemofiltration. *Clostridium difficile* was identified from stool cultures and antibiotics (vancomycin 125 mg four times daily) were started, but unfortunately he died.

DISCUSSION

Cases of *S bovis* meningitis are relatively rare in the literature. It was first described by Weitberg *et al* in 1981 where a colonic carcinoma was found at autopsy of a patient who died from *S bovis* meningitis.¹ There is, however, greater evidence between *S bovis* bacteraemia and endocarditis. *S bovis* is a group D Gram-positive coccus that is found in pairs or chains on blood agar. The species is found in the gut in small colonies. There are three sub biotypes differentiated by genetic differentiation (1, 2a and 2b),² two of which have greater evidence in the literature. Biotype I was associated particularly with endocarditis and biotype IIb with endocarditis and hepatobiliary infection.³

There are many descriptions of cases where *S bovis* bacteraemia led to identification of underlying bowel pathologies. These include large bowel tumour, diverticulitis, haemorrhoids and biliary infections.⁴ Interestingly, there are only two case reports where no evidence of underlying bowel pathology was found – *S bovis* infection was diagnosed as an independent event.⁵ It is theorised that either the underlying colonic disease or hepatic secretion of bile salts lead to an overgrowth of *S bovis* in the intestinal lumen.⁶ A compromised hepatic reticulo-endothelial system is thought to aid access into the systemic circulation. Western literature shows the commonest underlying causes of bacteraemia were endocarditis and carcinoma of the colon. A study based in Hong Kong showed greater links to biliary tract disease; namely acute cholangitis and cholecystitis.⁷

Meningitis is a rare presenting complaint. The ability of the bacterium to access the CSF through the blood brain barrier is still not fully understood. Cases previously described have mostly shown concomitant evidence of bacteraemia in cases of meningitis as was evident in this case.⁸

This case was complicated by *C difficile* infection. This can range in severity from relatively mild to fulminant disease with complications ranging from diarrhoea to

haemodynamic compromise/collapse. It is a spore-forming Gram-positive bacteria found commonly in the gastrointestinal tract.⁹ There has been much attention about the link to antibiotic therapy and the subsequent predisposition to infection noted in particular with the drug groups fluoroquinolones, β -lactamase inhibitors and 3rd generation cephalosporins. In relation to this case the patient received ceftriaxone as first line for the treatment of bacterial meningitis which most likely predisposed him to secondary *C difficile* infection.

Learning points

- Acute confusion may be the only presenting feature of acute meningitis and a thorough physical examination can clinch the diagnosis.
- In patients with sepsis, good quality cultures of blood, preferably from at least two different sites, are often vital in management and as in this case can even lead to recognition of underlying associated disease.
- *S bovis* bacteraemia should prompt investigations for infective endocarditis and colonic neoplasia.

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Competing interests None.

Patient consent Obtained.

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